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Mats Hedman

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EXAMINER

WEINSTEIN, LEONARD J

ART UNIT

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3746

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/524,536	Applicant(s) HEDMAN, MATS	
	Examiner LEONARD J. WEINSTEIN	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-15 is/are pending in the application.
- 4a) Of the above claim(s) 2 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment of October 14, 2008. In making the below rejections and/or objections the examiner has considered and addressed each of the applicant's arguments.
2. The examiner acknowledges the amendments to claims 1, 3, 6, 12, and 14.

Claim Objections

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 9 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a pressure balance to exist between gas to be evacuated and gas on an opposite side of the an outlet valve, the pressure on the opposite of the outlet valve being monitored by a sensor, does not reasonably provide enablement for the pressure on the opposite of the outlet valve being controlled by a sensor. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to operate the invention commensurate in scope with these claims. By definition a sensor does not control a pressure or in general the parameter that is being sensed, it only monitors that parameter and discloses its value.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims 1, 6, 8, 9, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. In claim 1 the recitation of "a control method for controlling the gas flow by a piston compressor provided to deliver a varying need of pressurized gas in which a volume of gas expanded" is ambiguous and unclear. For the purposes of the office action on the merits the limitation will be considered to be --- a control method for controlling the gas flow to a piston compressor which delivers a varying need of pressurized gas including the step of a volume of gas being expanded --- for proper clarity.

8. Claim 6 recites the limitation "the inlet" in line 1. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 8 recites the limitation "the outlet" in line 1. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 9 is rejected under 35 U.S.C. §112 second paragraph for the following:

a. Claim 9 recites the limitation "registers the cylinder pressure" in line 5-6. There is insufficient antecedent basis for this limitation in the claim. The examiner is well aware that a piston almost inherently reciprocates within a cylinder however claim 1 does not include a recitation of this structural component for the apparatus performing the method claimed. A proper recitation in either claim 1 or 9 including explicit language directed towards the

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relationship between a piston and the cylinder in which it reciprocates is required to overcome this rejection.

b. Claim 9 recites the limitation "the tank" in line 6. There is insufficient antecedent basis for this limitation in the claim.

c. In claim 9 the recitation of "another sensor" is vague and ambiguous. For the purposes of the office action on the merits the limitation will be considered to be --- a second sensor --- for proper clarity. Appropriate correction is required.

d. In claim 9 the recitation of "the latter" is a reference to a pressure that is to be sensed of the gas on the opposite side of an outlet valve (opposite to that of the side in direct communication with interior of a compression cylinder).

However the limitations that follow imply that the parameter that is really being sensed is that of the pressure gas inside of the cylinder. This corresponds to the pressure that is sensed by element 18 as disclosed by the instant application.

Therefore it is the examiner position that language of "the latter" was intended by the applicant to be --- the pressure of the former --- as this language is commensurate in scope with the specification. Appropriate correction is required.

11. Claim 10 recites the limitation "the tank" in line 3 and "the equipment" in line 4. There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 3, 5, 11, 12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagel EP 1,195,503, with reference to Nagel US 2002/0179037, support for equivalence between the international and US applications provided by online translation of Nagel EP 1,195,503 acquired from <http://ep.espacenet.com/?locale=en> EP and supplied herewith. Nagel teaches all the limitations as claimed for a control method for controlling the gas flow to a piston compressor 23 which delivers a varying need of pressurized gas including: [claim 1] the step of a volume of gas being expanded during an intake stroke and the introduced volume of gas is compressed and taken out through at least one of a non return valve 29 during an evacuation stroke, and in which the compressor 23 has a controllable inlet valve 24 that is pneumatically (§0021), hydraulically or electromagnetically (§0035) operable and that is opened and closed upon basis of a signal from a control system 33, wherein the inlet valve 24 is kept closed during at least a part of an intake stroke somewhere along a path of said piston 28 from an upper dead point to a lower dead point, the closure timing of the controllable inlet valve 24 being based on a varying need of pressurized gas to be delivered by the compressor 23 (§0021); **[claim 3]** a cycle comprises one intake stroke and one evacuation stroke of the piston 28, and wherein the frequency of cycles with closed intake stroke is varied between 0% and 100% of the number of revolutions per minute of a shaft 2 (as it is connected via elements 3, 4, 6, and 58 to element 22) of said compressor 23 in order to, at the given number of revolutions per minute, deliver the

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amount of the compressed gas required for the moment; **[claim 5]** an inlet valve 24 is closed upon transition, or after the transition, from intake stroke to evacuation stroke (§0021, §0034); **[claim 11]** a computer program (via control of element 33) adapted for executing the control method according to claim 1 (§0021); **[claim 12]** and a cycle comprises one intake stroke and one evacuation stroke of the piston 28, and wherein the frequency of cycles with closed intake stroke is varied between 50% and 100% of the number of revolutions per minute of a shaft 2 (as it is connected via elements 3, 4, 6, and 58 to element 22) of said compressor 23 in order to, at the given number of revolutions per minute, deliver the amount of the compressed gas required for the moment.

Further Nagel teaches all the limitations as claimed a control method for controlling the gas flow by a compressor 23 having a piston 28 including: **[claim 14]** the step of expanding the volume of an introduced gas during an intake stroke, compressing the introduced volume of gas and evacuating the same amount of gas introduced through at least one a non-return valve 29 for outflow during an evacuation stroke, pneumatically, hydraulically or electromagnetically operating a controllable inlet valve 24 of the compressor 23 to open and close upon a basis of a signal from a control system 33, and keeping the inlet valve 24 closed during at least part of an intake stroke somewhere along a path of said piston 28 from upper dead center to lower dead center, closure timing of the controllable inlet valve 24 being based on a varying need of pressurized gas to be delivered by the compressor 23 (§0021, §0034).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. Claims 1, 3, 5-12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturman et al US 6,415,749 in view of Nagel EP 1,195,503 (reference to Nagel US 2002/0179037, support for equivalence between the international and US applications provided by online translation of Nagel EP 1,195,503 acquired from <http://ep.espacenet.com/?locale=en> EP and supplied herewith). Sturman teaches all the limitations as claimed for a control method for controlling the gas flow to a piston compressor 28' which delivers a varying need of pressurized gas including: **[claim 1]** the step of a volume of gas being expanded during an intake stroke and the introduced volume of gas is compressed and taken out through at least one of a non return valve 38 during an evacuation stroke, and in which the compressor 28' has a controllable inlet valve 30' that is pneumatically, hydraulically or electromagnetically

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(col. 12 ll. 63 – col. 13 ll. 7) operable and that is opened and closed upon basis of a signal from a control system 164, wherein the inlet valve 30' is capable of being kept closed during at least a part of an intake stroke somewhere along a path of said piston 32 from an upper dead point to a lower dead point, the closure timing of the controllable inlet valve 30' being based on a signal from a control system 164 (in connection with element 56 as shown by communication line between element 30 and 166 in figure 6 as applied to the embodiment of figure 4); **[claim 6]** the step wherein an inlet 42' of the compressor 28' besides the controllable inlet valve 30', comprises a non return valve 30" for inflow, and that a conduit 42" for supply of gas to the latter is throttled down or closed by means of a closure member (48 of 30") arranged by or upstream the non return valve 30", by controlling the gas pressure in a tank 214 associated to the compressor 32; **[claim 7]** the step wherein the closure member (48 of 30") is a controllable valve, which is opened and closed upon basis of a signal from the control system 164 (col. 13 ll. 8-21); **[claim 8]** the step wherein an outlet 44 of the compressor 28', apart from a non return valve for outflow, comprises a controllable outlet valve 98 which is pneumatically, hydraulically or electro-magnetically operated, and which opens and closes upon basis of a signal from the control system 164; **[claim 9]** the step wherein the outlet valve 38 is opened as there is a pressure balance between the gas to be evacuated and the gas on the opposite side of the outlet valve 38, the pressure of the former being monitored by means of a sensor 166 that registers a cylinder pressure that is compared to the pressure in a tank 36 registered by a second sensor 194; **[claim 10]** and the step wherein a conduit 42" that extends between the compressor 28'

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and a tank 36 fulfills the need of pressurized gas between the compressor 28' and the equipment 34 that will use the pressurized gas.

Further Sturman teaches all the limitations as claimed a control method for controlling the gas flow by a compressor 28' having a piston 32 including: **[claim 14]** the step of expanding the volume of an introduced gas during an intake stroke, compressing the introduced volume of gas and evacuating the same amount of gas introduced through at least one non-return valve 38 for outflow a an evacuation stroke, pneumatically, electromagnetically operating a controllable inlet valve 30' of the compressor 28' to open and close upon a basis of a signal from a control system 164 that is capable of keeping the inlet valve 30' closed during at least part of an intake stroke somewhere along a path of said piston 32 from upper dead center to lower dead center, closure timing of the controllable inlet valve 30' being based a control signal from a control system 164; **[claim 15]** the step wherein compressor 28' is connected to a combustion engine 12 and is supplied with pressurized air from a turbo or screw compressor 214 of said combustion engine 12 (col. 15 ll. 11-16).

Sturman fails to teach the following limitations that are taught by Nagel for a method for controlling a gas flow to a compressor including the steps of: **[claim 1]** the step of a volume of gas being expanded during an intake stroke and the introduced volume of gas is compressed and taken out through at least one of a non return valve 29 during an evacuation stroke, and in which the compressor 23 has a controllable inlet valve 24 that is pneumatically (§0021), hydraulically or electromagnetically (§0035) operable and that is opened and closed upon basis of a signal from a control system 33,

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wherein the inlet valve 24 is kept closed during at least a part of an intake stroke somewhere along a path of said piston 28 from an upper dead point to a lower dead point, the closure timing of the controllable inlet valve 24 being based on a varying need of pressurized gas to be delivered by the compressor 23 (§0021); **[claim 3]** a cycle comprises one intake stroke and one evacuation stroke of the piston 28, and wherein the frequency of cycles with closed intake stroke is varied between 0% and 100% of the number of revolutions per minute of a shaft 2 (as it is connected via elements 3, 4, 6, and 58 to element 22) of said compressor 23 in order to, at the given number of revolutions per minute, deliver the amount of the compressed gas required for the moment; **[claim 5]** an inlet valve 24 is closed upon transition, or after the transition, from intake stroke to evacuation stroke (§0021, §0034); **[claim 11]** a computer program (via control of element 33) adapted for executing the control method according to claim 1 (§0021); **[claim 12]** a cycle comprises one intake stroke and one evacuation stroke of the piston 28, and wherein the frequency of cycles with closed intake stroke is varied between 50% and 100% of the number of revolutions per minute of a shaft 2 (as it is connected via elements 3, 4, 6, and 58 to element 22) of said compressor 23 in order to, at the given number of revolutions per minute, deliver the amount of the compressed gas required for the moment; and a control method for controlling the gas flow by a compressor 23 having a piston 28 including: **[claim 14]** the step of expanding the volume of an introduced gas during an intake stroke, compressing the introduced volume of gas and evacuating the same amount of gas introduced through at least one a non-return valve 29 for outflow during an evacuation stroke, pneumatically,

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hydraulically or electromagnetically operating a controllable inlet valve 24 of the compressor 23 to open and close upon a basis of a signal from a control system 33, and keeping the inlet valve 24 closed during at least part of an intake stroke somewhere along a path of said piston 28 from upper dead center to lower dead center, closure timing of the controllable inlet valve 24 being based on a varying need of pressurized gas to be delivered by the compressor 23 (§0021, §0034).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify a method for providing a flow of gas or fluid to a compressor using a controllable valve, as taught by Sturman, to include the step of closing an inlet valve during a portion of an intake stroke of a piston, as taught by Nagel, in order to more accurately control the air to fuel ratio of fluid that is supplied to a combustion engine (Nagel - §0008).

Allowable Subject Matter

17. Claims 4 and 13 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

18. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD J. WEINSTEIN whose telephone number is

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(571)272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
Unit 3746

/Leonard J Weinstein/
Examiner, Art Unit 3746